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PICTURE OF THE MONTH

An Upper Tropospheric System

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Upper tropospheric, midoceanic troughs found over the North Pacific and North Atlantic during the summer greatly influence the weather in these areas. These troughs are best defined at the 200-mb level. They can exist as a shear line, or they may contain a series of well-developed vortices. The cloud amount, distribution, and organization associated with such an upper level trough depend on the size and vertical extent of the upper circulation and conditions in the lower troposphere. The latter include sea-surface temperature, strength of any inversion, the moisture content, and stability.

In the eastern North Pacific, a cold sea surface and low tropospheric inversion result in extensive areas of low thin fog, stratus, or stratocumulus. Upper level vortices

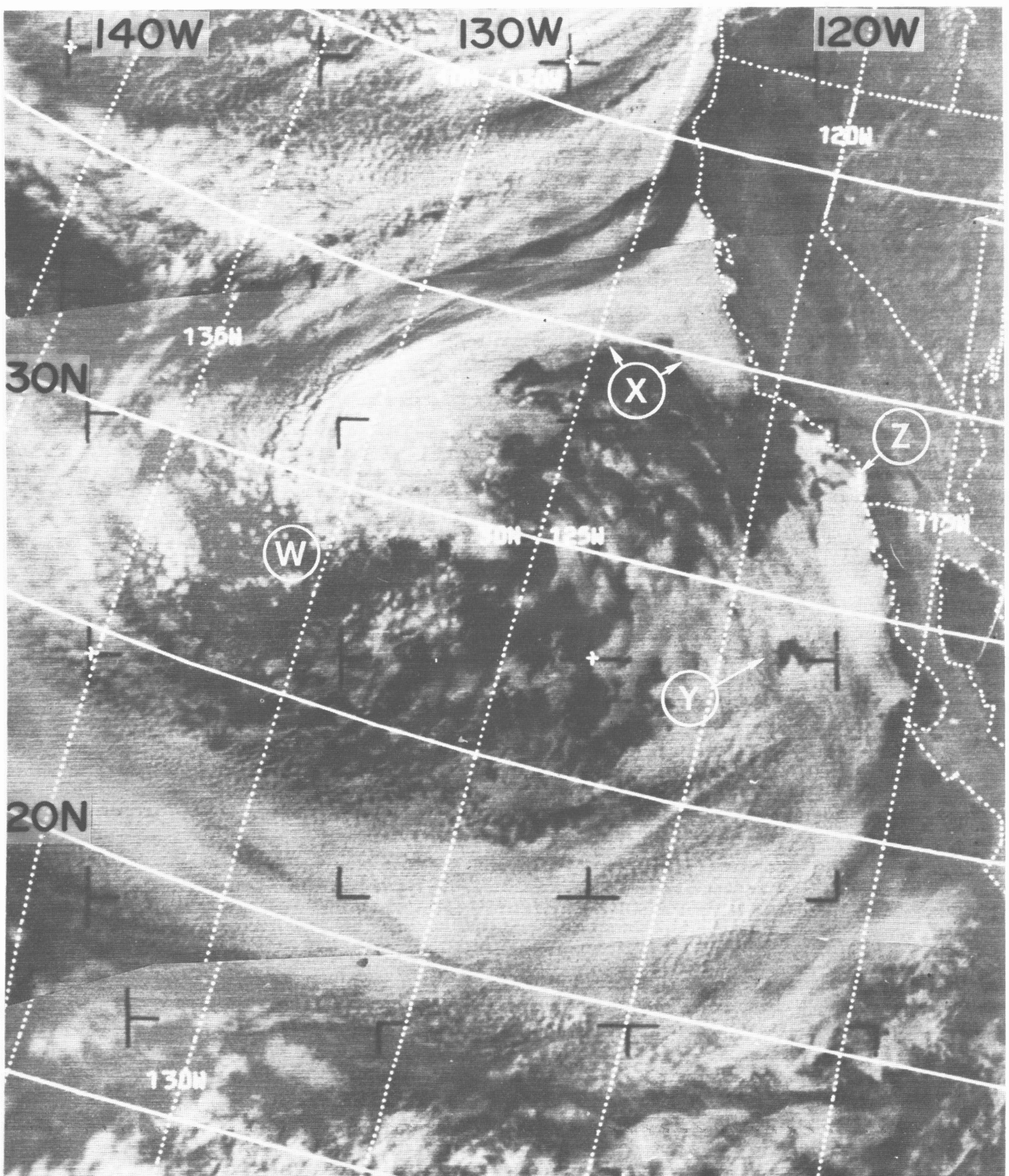

FIGURE 1.—ESSA-5 mosaic, Pass 5495, 0010 GMT, June 27, 1968.

FIGURE 2.—ESSA–5 mosaic with superimposed surface streamlines (black) and 200-mb streamlines (white) for 0000 GMT, June 27, 1968.

that occur in this area are often detectable from their effects on the distribution of low-level cloudiness. This can be seen in figure 1, where a circulation pattern appears in the low clouds off the west coast of the United States. The upper level Low, at this time, was centered at (W). Beneath the upper Low, there is a decrease in cloud amount. Here, the increased instability and higher, weaker inversion allows greater vertical development of the remaining cloud elements. These cloud elements vary in size and brightness and form a "ragged" cloud field. Farther north at (X), where the inversion is lower and the atmosphere more stable, cloud cover is more continuous, has smooth regular edges, and is made up of cloud elements that are more uniform is size.

A surface and 200-mb streamline analysis, based on 0000 GMT data, has been superimposed on the satellite mosaic in figure 2. The slightly cyclonic surface flow (A) and the existing island barriers south of Los Angeles result in an interesting cloud distribution. Clearing on the leeward side of an island barrier is most pronounced when the low-level flow is perpendicular to the barrier. The size of the clearing is related to the size and height of the barrier. In figure 1, note the large clearing south of Guadalupe Island (Y) and the smaller clear areas beyond the Channel Islands (Z).